

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference simacPCT-5	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IT00/00042	International filing date (day/month/year) 11/02/2000	Priority date (day/month/year) 08/03/1999
International Patent Classification (IPC) or national classification and IPC B21B31/04		
Applicant S.I.M.A.C. SPA		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 4 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 04/10/2000	Date of completion of this report 15.06.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Rechler, W Telephone No. +49 89 2399 2354 

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

D'AGOSTINI, G.
D'AGOSTINI ORGANIZZAZIONE SRL
Via G. Giusti 17
33100 Udine
ITALIE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

Date of mailing (day/month/year)	15.06.2001
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Applicant's or agent's file reference simacPCT-5	IMPORTANT NOTIFICATION
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International application No. PCT/IT00/00042	International filing date (day/month/year) 11/02/2000	Priority date (day/month/year) 08/03/1999
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Applicant S.I.M.A.C. SPA

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
---------------------------------------	--------------------

 <p>European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465</p>	<p>Marra, E</p> <p>Tel. +49 89 2399-7235</p>
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**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IT00/00042

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

2-5	as originally filed		
1	as received on	14/02/2001	with letter of 13/02/2001

Claims, No.:

1-6	as received on	14/02/2001	with letter of 13/02/2001
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Drawings, sheets:

1/5-5/5	as originally filed
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IT00/00042

- ☐ the description, pages:
☒ the claims, Nos.: 7 - 9
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 1 - 6
	No:	Claims
Inventive step (IS)	Yes:	Claims 1 - 6
	No:	Claims
Industrial applicability (IA)	Yes:	Claims 1 - 6
	No:	Claims

- 2. Citations and explanations**
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

Section V:

1. Prior art document US-A-5 613 392, which is indicated on page 1 of the description as relevant background art, discloses a disassemblable rolling mill stand with the features of the first part of independent claim 1, in particular comprising a "U"-shaped base-ment with uprights to include the upper horizontal roll.
2. The problem to be solved by the present invention was to improvement the known disassemblable rolling mill stand, especially with regard to a higher strength and a simpler construction which permits an easier exchange of the parts.

This problem is solved by the combination of features set out in the independent claim 1, in particular by the special "C"-shaped design of the vertical guides and counter-guides.

3. The present invention shall be considered to be new because no cited prior art docu-ment discloses all features of independent claim 1 in combination.
4. The cited documents do not disclose the essential subject matter concerning the spe-cial "C"-shaped design of the vertical guides and counter-guides. The available prior art documents cannot give the skilled person any lead to provide this subject matter at known rolling mill stands and to combine all features defining the invention according to independent claim 1.
5. The invention shall be considered as susceptible of industrial application because it can be made or used in the metal processing industry.
6. Claims 2 - 6 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Section VII:

Documents US-A-561339292 (should read US-A-5 613 392) and US-A-5497664 (should read US-A-5 497 644) are incorrectly cited.

TENT COOPERATION TRE Y

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 10 November 2000 (10.11.00)	
International application No. PCT/IT00/00042	Applicant's or agent's file reference simacPCT-5
International filing date (day/month/year) 11 February 2000 (11.02.00)	Priority date (day/month/year) 08 March 1999 (08.03.99)
Applicant NARDUZZI, Lorenzo	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 04 October 2000 (04.10.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Zakaria EL KHODARY Telephone No.: (41-22) 338.83.38
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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference simacPCT-5	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/IT 00/ 00042	International filing date (day/month/year) 11/02/2000	(Earliest) Priority Date (day/month/year) 08/03/1999
Applicant S.I.M.A.C. SPA		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1
☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IT 00/00042

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B21B31/04 B21B31/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 497 644 A (POLONI ALFREDO ET AL) 12 March 1996 (1996-03-12) column 4 -column 5; figures ---	1,2,4-9
A	US 5 590 557 A (AFFLERBACH ERHARD ET AL) 7 January 1997 (1997-01-07) column 2 -column 4; figures ---	1-3,6,8, 9
A	WO 94 21395 A (TINGVALL LARS ;GRANHOLM BOERJE (SE); LEKSEN FOLKE (SE); DANIELSSON) 29 September 1994 (1994-09-29) page 3 -page 6; figures 1-5 ---	1-3,6,8, 9
A	EP 0 531 676 A (SIMAC SPA) 17 March 1993 (1993-03-17) cited in the application the whole document --- -/--	1,2,4, 7-9



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

27 June 2000

Date of mailing of the international search report

05/07/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Rosenbaum, H

INTERNATIONAL SEARCH REPORT

International Application No.

T/IT 00/00042

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 613 392 A (HAMRATHS KONRAD ET AL) 25 March 1997 (1997-03-25) column 2 -column 4; figures ---	1-3, 6, 8
A	EP 0 040 584 A (DANIELI OFF MECC) 25 November 1981 (1981-11-25) page 5 -page 8; figures 1-7 ---	1-3, 6, 8
A	WO 98 15365 A (SIMAC SPA ;OFFOIACH RENZO (IT)) 16 April 1998 (1998-04-16) cited in the application the whole document -----	1, 2, 6, 8, 9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

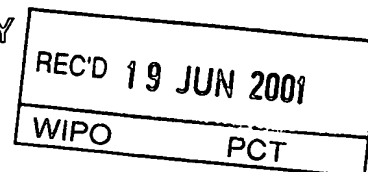
PCT/IT 00/00042

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5497644	A	12-03-1996	BG 50494 A JP 2076894 A	14-08-1992 16-03-1990
US 5590557	A	07-01-1997	DE 4340313 A AT 210794 A IT MI942347 A,B JP 7300260 A SE 506567 C SE 9403866 A	01-06-1995 15-11-1998 26-05-1995 14-11-1995 12-01-1998 27-05-1995
WO 9421395	A	29-09-1994	SE 503909 C CN 1121326 A EP 0699111 A SE 9300846 A	30-09-1996 24-04-1996 06-03-1996 16-09-1994
EP 0531676	A	17-03-1993	IT 1252823 B US 5457979 A	28-06-1995 17-10-1995
US 5613392	A	25-03-1997	DE 4337935 A AT 406552 B AT 205094 A IT 1270713 B JP 7185614 A SE 506566 C SE 9403747 A	11-05-1995 26-06-2000 15-11-1999 07-05-1997 25-07-1995 12-01-1998 07-05-1995
EP 0040584	A	25-11-1981	IT 1141791 B BR 8102735 A	08-10-1986 26-01-1982
WO 9815365	A	16-04-1998	IT UD960188 A AU 4637497 A EP 0934130 A	07-04-1998 05-05-1998 11-08-1999

09/19/14/180

PATENT COOPERATION TREATY

PCT



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference simacPCT-5	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IT00/00042	International filing date (day/month/year) 11/02/2000	Priority date (day/month/year) 08/03/1999
International Patent Classification (IPC) or national classification and IPC B21B31/04		
Applicant S.I.M.A.C. SPA		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


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- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

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- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 04/10/2000	Date of completion of this report 15.06.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Rechler, W Telephone No. +49 89 2399 2354



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IT00/00042

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

2-5 as originally filed

1 as received on 14/02/2001 with letter of 13/02/2001

Claims, No.:

1-6 as received on 14/02/2001 with letter of 13/02/2001

Drawings, sheets:

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/IT00/00042**

- ☐ the description, pages:
☒ the claims, Nos.: 7 - 9
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1 - 6
	No: Claims
Inventive step (IS)	Yes: Claims 1 - 6
	No: Claims
Industrial applicability (IA)	Yes: Claims 1 - 6
	No: Claims

- 2. Citations and explanations**
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

Section V:

1. Prior art document US-A-5 613 392, which is indicated on page 1 of the description as relevant background art, discloses a disassemblable rolling mill stand with the features of the first part of independent claim 1, in particular comprising a "U"-shaped base-ment with uprights to include the upper horizontal roll.
2. The problem to be solved by the present invention was to improvement the known disassemblable rolling mill stand, especially with regard to a higher strength and a simpler construction which permits an easier exchange of the parts.

This problem is solved by the combination of features set out in the independent claim 1, in particular by the special "C"-shaped design of the vertical guides and counter-guides.

3. The present invention shall be considered to be new because no cited prior art docu-ment discloses all features of independent claim 1 in combination.
4. The cited documents do not disclose the essential subject matter concerning the spe-cial "C"-shaped design of the vertical guides and counter-guides. The available prior art documents cannot give the skilled person any lead to provide this subject matter at known rolling mill stands and to combine all features defining the invention according to independent claim 1.
5. The invention shall be considered as susceptible of industrial application because it can be made or used in the metal processing industry.
6. Claims 2 - 6 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Section VII:

Documents US-A-561339292 (should read US-A-5 613 392) and US-A-5497664 (should read US-A-5 497 644) are incorrectly cited.

Amex

1

DESCRIPTIONDISASSEMBLABLE ROLLING MILL STANDTechnical Field

The present invention has for object a disassemblable rolling mill stand.

Background Art

In prior art, disassemblable rolling mill stands are known.

Solutions of disassemblable rolling mill stands are known, see for example IT-UD91A000118 (US-A-5,457,979) and PCT/IT/97/00237 (WO 98/15365) that uses two couples of screw-stays or screw tie-rods (1,2,3,4), to join and tie the different components of a horizontal rolling stand, using a "U" shaped support basement realizing a cage (9) that extends upwards with uprights (90) till to enclose the lower part, including the lower horizontal cylinder (51), of the whole horizontal rolling stand. US-A-561339292 discloses a similar horizontal rolling stand with "U"-shaped basement whose uprights (2) extend upwards to encase (cage) the whole structure of the roller assemblies (both lower and upper cylinder). A "U" shape basement is also disclosed in EP-A-0040584 (Ref.24), regarding a stand for stationary rolling line, but the uprights (24) of this "U"-shaped basement do not extend to enclose the lower horizontal cylinder. US-A-5497664 discloses a disassemblable universal rolling mill stand with a flat basement not having a "U"-shape feature.

Because of their being disassemblable, the present rolling mill stands have a limited solidity or strength and anyway the fact of being disassemblable limits their reliability, also making the assembling system complex.

However, the disassemblable rolling mill stands have great advantages, first of all, the possibility of interchanging the different component elements and also of easily intervening for the change or maintenance of their parts and of the component elements subjected to wear such as the rolling cylinders.

The purpose of the present invention is that of obviating the above mentioned drawbacks and of providing in particular a simple rolling mill stand, more efficient, with a complete, easy and fast interchangeability of the component parts, and nevertheless, having the highest compactedness and strength.

The problem is solved as claimed by means of a disassemblable rolling mill stand, of the type involving a substantially "U"-shaped embedding bedplate structure, within which the rolling mill assembly, with at least a couple of horizontal rolling cylinders, is embedded and fixed by fixing means, characterised in that said substantially "U"-shaped embedding structure:

Claims

- 1
2 1. Disassemblable rolling mill stand, of the type involving a bedplate
3 structure with a substantially "U"-shaped embedding (1), within which a
4 rolling mill assembly (2), with at least one couple of horizontal rolling
5 cylinders (210-310), is embedded and fixed by fixing means (202-10/12) to
6 said bedplate (1),
7 wherein said substantially "U"-shaped embedding structure
8 - extends upwards with opposite vertical-guide uprights (11) to
9 include the upper horizontal cylinder (210-310),
10 - realizes vertical sliding embedding guide means (11) with
11 corresponding opposite vertical counter-guides (201) in said rolling mill
12 assembly (2) which couple inside of said opposite vertical-guide uprights
13 (11),
14 characterised in that
15 - said opposite vertical counter-guides (201) have external side retaining
16 extensions (201-200 realised with sliding surfaces (200) substantially
17 shaped like a "C" and opposite C", horizontally outwards opened (11-110-
18 201).
19 2. Disassemblable rolling mill stand according to the preceding claims,
20 characterised in that said rolling mill assembly (2) is a universal rolling
21 mill assembly with couple of horizontal cylinders (210), and couple of
22 extractable vertical rolling mill side assemblies (22-220), laterally
23 extractable and interchangeable by means of eight horizontal large
24 screws, opposite four by four (202).
25 3. Rolling mill stand according to the preceding claim, characterised in
26 that said eight horizontal large screws, opposite four by four (202), are
27 identical to said fixing means, which guide and tighten not only said
28 extractable vertical rolling mill side assemblies (22-220) on the centrally

1 arranged horizontal rolling mill assembly (21), but also the whole
2 universal rolling mill assembly (2) between said guide uprights (11).

3 4. Disassemblable rolling mill stand according to claim 1., characterised
4 in that said rolling mill assembly (2) includes a single couple of
5 horizontal rolling cylinders (3-310).

6 5. Disassemblable rolling mill stand according to the preceding
7 claims, characterised in that said fixing means consist of eight rotatable
8 large screws (10-12), of which:

9 - four opposite rotatable large screws (10), are upperly pivoted in
10 couple, to the corners of said guide uprights (11) of said bedplate (1) and,
11 - four opposite rotatable large screws (12), are pivoted in couple, on the
12 base of said bedplate (1).

13 6. Disassemblable rolling mill stand according to the preceding claims,
14 characterised in that said rolling mill assembly (2) contains two couples
15 of screw-stay-rods (212) operating on respective gaskets for the holding
16 of horizontal rolling cylinders (210).

17



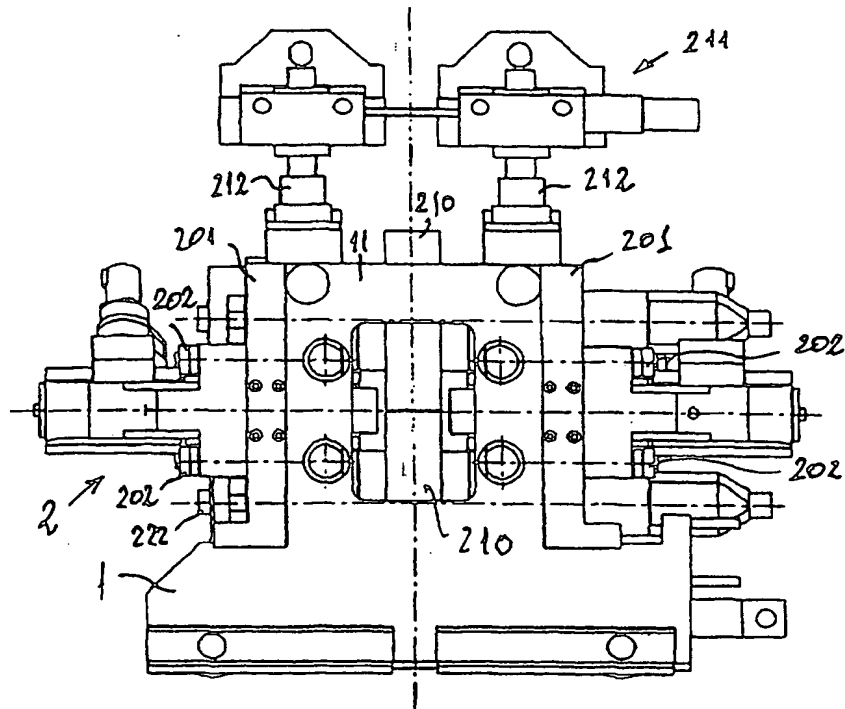
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: DISASSEMBLABLE ROLLING MILL STAND

(57) Abstract

Disassemblable rolling mill stand, of the type involving a bedplate structure with a substantially "U"-shaped embedding structure (1), within which the rolling mill assembly is embedded and fixed (2), with at least one couple of horizontal rolling cylinders (210-310), by fixing means (202-10/12), of said substantially "U"-shaped embedding structure, which extends upwards at least up to the upper horizontal cylinder axis of said couple of horizontal rolling cylinders (210-310) and makes up vertical sliding jointed guide elements (11-110) with corresponding opposite vertical counter-guides (201) in the rolling mill assembly (2).



DESCRIPTIONDISASSEMBLABLE ROLLING MILL STANDTechnical Field

The present invention has for object a disassemblable rolling mill stand.

Background Art

In prior art, disassemblable rolling mill stands are known.

Solutions of disassemblable rolling mill stands are known, see for example IT-UD91A000118 and PCT/IT/97/00237.

Because of their being disassemblable, the present rolling mill stands have a limited solidity or strength and anyway the fact of being disassemblable limits their reliability, also making the assembling system complex.

However, the disassemblable rolling mill stands have great advantages, first of all, the possibility of interchanging the different component elements and also of easily intervening for the change or maintenance of their parts and of the component elements subjected to wear such as the rolling cylinders.

The purpose of the present invention is that of obviating the above mentioned drawbacks and of providing in particular a simple rolling mill stand, more efficient, with a complete, easy and fast interchangeability of the component parts, and nevertheless, having the highest compactedness and strength.

The problem is solved as claimed by means of a disassemblable rolling mill stand, of the type involving a substantially "U"-shaped embedding bedplate structure, within which the rolling mill assembly, with at least a couple of horizontal rolling cylinders, is embedded and fixed by fixing means,

characterised in that said substantially "U"-shaped embedding structure:

1 - extends upwards with opposite uprights, up to at least the upper
2 horizontal cylinder axis of said couple of horizontal rolling cylinders;
3 - it makes up vertical sliding jointed guide elements with
4 corresponding opposite vertical counter-guides in said rolling mill
5 assembly which couple inside of said opposite uprights with external
6 retaining side extension, making up a joint, on the horizontal plane, with
7 guide walls substantially shaped like two outwardly opened opposite "C".
8 Thus there is the advantage of simplifying the structure even allowing
9 the total disassemblability and the highest compactedness and strength.
10 In particular the guide system with opposite vertical guide uprights with
11 inside-outside embedding, gives the highest solidity and safety in addition
12 to a functionality which equals the integral structures, reducing at the
13 minimum the slacks and dangers deriving from loosening.
14 Advantageously in the universal stand solutions eight horizontal large
15 screws, four by four opposite, which at the same time tighten on the
16 horizontal centre rolling mill assembly, two side extractable assemblies,
17 and the whole assembly between said uprights, are used.
18 In alternative said bedplate is intended to receive a rolling mill assembly
19 with horizontal cylinders with eight engaged pivoting large screws: four
20 upperly on the guide uprights and four at the base.
21 These and other advantages will appear from the following description of
22 a preferential embodiment solution, with the aid of the enclosed
23 drawings, whose execution details are not to be considered as limiting but
24 are only given as an example.
25 Figures 1 and 2 are front and side elevation schematic views of the
26 rolling mill stand operationally assembled with the universal rolling mill
27 assembly with horizontal and vertical rolling cylinders.
28 Figures 3 and 4 are front elevation schematic views like the preceding

1 bedplate matching with its sides (110).

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Claims

2 1. Disassemblable rolling mill stand, of the type involving a bedplate
3 structure with a substantially "U"-shaped embedding (1), within which a
4 rolling mill assembly (2), with at least one couple of horizontal rolling
5 cylinders (210-310), is embedded and fixed by fixing means (202-10/12) to
6 said bedplate (1),

7 characterised in that said substantially "U"-shaped embedding structure

8 - extends upwards with opposite vertical uprights (11)

9 - makes up vertical sliding jointed guide elements (11-110) with
10 corresponding opposite vertical counter-guides (201) in said rolling mill
11 assembly (2) which couple inside of said opposite guide uprights (11) and
12 outside with external side retaining extension (201-110).

13 2. Rolling mill stand according to claim 1.,

14 characterised in that said embedding structure:

15 - is substantially realised as vertically "U"-shaped with embedding
16 of said rolling mill assembly (2) between said uprights of the base (11),
17 and

18 - is realised with sliding surfaces substantially shaped like an
19 opposite C", horizontally outwards opened (11-110-201).

20 3. Rolling mill stand according to claim 1 and/or 2, characterised in that
21 said opposite guide uprights (11) extend at least up to the upper
22 horizontal cylinder of said couple of horizontal rolling cylinders (210-
23 310).

24 4. Rolling mill stand according to the preceding claims, characterised
25 in that said rolling mill assembly (2) is a universal rolling mill assembly
26 with couple of horizontal cylinders (210), and vertical rolling mill
27 opposite movable assemblies (220), laterally extractable and
28 interchangeable (22) by means of eight horizontal large screws, opposite

1 four by four (202).

2 5. Rolling mill stand according to the preceding claim, characterised in
3 that said eight horizontal large screws, opposite four by four (202), are
4 identical to said fixing means, which guide and tighten not only said
5 vertical rolling mill extractable opposite side assemblies (22-220) on the
6 centrally arranged horizontal rolling mill assembly (21), but also the
7 whole universal rolling mill assembly (2) between said guide uprights
8 (11).

9 6. Plant according to claim 1., characterised in that said rolling mill
10 assembly (2) includes a single couple of horizontal rolling cylinders (3-
11 310).

12 7. Rolling mill stand according to the preceding claims, characterised in
13 that said fixing means consist of eight rotatable large screws (10-12), of
14 which:

15 - four opposite rotatable large screws in couple (10), are upperly
16 pivoted to the corners of said guide uprights (11) of said bedplate (1) and,

17 - four opposite rotatable large screws in couple (12), are pivoted
18 on the base of said bedplate (1).

19 8. Plant according to the preceding claims, characterised in that said
20 rolling mill assembly (2) contains two couples of screw-stays (212)
21 operating on respective gaskets for the holding of horizontal rolling
22 cylinders (210).

23 9. Plant according to the preceding claim, characterised in that the
24 motion transmission system for the removal and approach of the
25 horizontal rolling cylinders (210-310) occurs by means of said screw-
26 stays (212-312) which drive said cylinders-holder gaskets respectively
27 upper one (3100) and lower one (3101), and by means of the upper
28 transmission assembly (211-311).

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Claims

- 1
2 1. Disassemblable rolling mill stand, of the type involving a bedplate
3 structure with a substantially "U"-shaped embedding (1), within which a
4 rolling mill assembly (2), with at least one couple of horizontal rolling
5 cylinders (210-310), is embedded and fixed by fixing means (202-10/12) to
6 said bedplate (1),
7 wherein said substantially "U"-shaped embedding structure
8 - extends upwards with opposite vertical-guide uprights (11) to
9 include the upper horizontal cylinder (210-310),
10 - realizes vertical sliding embedding guide means (11) with
11 corresponding opposite vertical counter-guides (201) in said rolling mill
12 assembly (2) which couple inside of said opposite vertical-guide uprights
13 (11),
14 characterised in that
15 - said opposite vertical counter-guides (201) have external side retaining
16 extensions (201-200 realised with sliding surfaces (200) substantially
17 shaped like a "C" and opposite C", horizontally outwards opened (11-110-
18 201).
19 2. Disassemblable rolling mill stand according to the preceding claims,
20 characterised in that said rolling mill assembly (2) is a universal rolling
21 mill assembly with couple of horizontal cylinders (210), and couple of
22 extractable vertical rolling mill side assemblies (22-220), laterally
23 extractable and interchangeable by means of eight horizontal large
24 screws, opposite four by four (202).
25 3. Rolling mill stand according to the preceding claim, characterised in
26 that said eight horizontal large screws, opposite four by four (202), are
27 identical to said fixing means, which guide and tighten not only said
28 extractable vertical rolling mill side assemblies (22-220) on the centrally

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1 arranged horizontal rolling mill assembly (21), but also the whole
2 universal rolling mill assembly (2) between said guide uprights (11).

3 4. Disassemblable rolling mill stand according to claim 1., characterised
4 in that said rolling mill assembly (2) includes a single couple of
5 horizontal rolling cylinders (3-310).

6 5. Disassemblable rolling mill stand according to the preceding
7 claims, characterised in that said fixing means consist of eight rotatable
8 large screws (10-12), of which:

9 - four opposite rotatable large screws (10), are upperly pivoted in
10 couple, to the corners of said guide uprights (11) of said bedplate (1) and,
11 - four opposite rotatable large screws (12), are pivoted in couple, on the
12 base of said bedplate (1).

13 6. Disassemblable rolling mill stand according to the preceding claims,
14 characterised in that said rolling mill assembly (2) contains two couples
15 of screw-stay-rods (212) operating on respective gaskets for the holding
16 of horizontal rolling cylinders (210).

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